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Abigail Woods* *Imperial College London*

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Rethinking the History of Modern Agriculture: British Pig Production, c.1910–65

Abstract

This article uses a study of pig production in Britain, c.1910–65, to rethink the history of modern agriculture and its implications for human–animal relationships. Drawing on literature written by and for pig producers and experts, it challenges existing portrayals of a unidirectional, post-Second World War shift from traditional small-scale mixed farming to large, specialized, intensive systems. Rather, ‘factory-style’ pig production was already established in Britain by the 1930s, and its fortunes waxed and waned over time in relation to different kinds of outdoor production, which was still prominent in the mid-1960s. In revealing that the progressive proponents of both indoor and outdoor methods regarded them as modern and efficient, but defined and pursued these values in quite different ways, the article argues for a more historically situated understanding of agricultural modernity. Analysis reveals that regardless of their preferred production system, leading experts and producers were keen to develop what they considered to be natural methods that reflected the pig’s natural needs and desires. They perceived pigs as active, sentient individuals, and believed that working in harmony with their natures was essential, even if this was, ultimately, for commercial ends. Such views contradict received accounts of modern farming as a utilitarian enterprise, concerned only with dominating and manipulating nature. They are used to argue that a romantic, moral view of the pig did not simply pre-date or emerge in opposition to modern agriculture, but, rather, was integral to it.

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The historiography of twentieth-century livestock production tells a straightforward story of industrialization. Whether focused on policy,¹ science and technology,² production practices,³ or social change,⁴ accounts describe a transition from traditional, small, labour-intensive mixed farming, to modern, large-scale, mechanized and specialized production. In Britain, this transition is located to the immediate post-Second World War decades, when state support combined with scientific and technical advance enabled a rapid increase in the quantity and efficiency of food production.⁵ As agriculture intensified, its detrimental effects on animal welfare attracted increasing criticism, most notably from Ruth Harrison's 1964 book, *Animal Machines*.⁶ Nevertheless, the conviction that intensification served the national interest survived until the 1980s.

One of the problems with this narrative is its teleological orientation. Authors tend to regard intensive farming as an end point and set out to determine how it was reached. The resulting linear accounts either ignore key changes that do not fit into this general trajectory, or place them within the entirely separate sphere of organic farming.⁷ The nature of 'modern', 'efficient', and 'productive' agriculture is assumed to be self-evident. Authors do not consider what these terms meant, and to whom, or how their meanings changed over time in relation to production practices and the social, political and economic context. Similar weaknesses are displayed by sociological accounts of

¹ J. K. Bowers, 'British Agricultural Policy Since the Second World War', *Agricultural History Review*, 33 (1985), 66–76; M. Smith, *The Politics of Agricultural Support in Britain* (Dartmouth, 1990); M. Winter, *Rural Politics: Policies for Agriculture, Forestry and the Environment* (London, 1996).

² G. W. Cooke (ed.), *Agricultural Research 1931–81* (London, 1981); K. Blaxter and N. Robertson, *From Dearth to Plenty: The Modern Revolution in Food Production* (Cambridge, 1995).

³ P. Brassley, 'Output and Technical Change in Twentieth Century British Agriculture', *Agricultural History Review*, 48 (2000), 60–84; A. Godley and B. Williams, 'The Chicken, the Factory Farm and the Supermarket: The Emergence of the Modern Poultry Industry in Britain', University of Reading Business School Working Paper, 2007; J. Martin, 'The Commercialisation of British Turkey Production', *Rural History*, 20 (2009), 209–28; K. Sayer, "'Stimulighting" and "Twilighting": The Ecology of Standardized Poultry Technology', *History of Technology*, 28 (2009), 149–68.

⁴ A. Howkins, *The Death of Rural England: A Social History of the Countryside Since 1900* (London, 2003).

⁵ J. Martin, *The Development of Modern Agriculture: British Farming since 1931* (Basingstoke, 2000).

⁶ R. Harrison, *Animal Machines: The New Factory Farming Industry* (London, 1964).

⁷ T. Clunies-Ross, 'Agricultural Change and the Politics of Organic Farming', Unpublished PhD thesis, University of Bath, Bath, UK, 1990; P. Conford, *The Origins of the Organic Movement* (Edinburgh, 2001).

late twentieth-century shifts away from intensive, 'productivist' agriculture to more sustainable, 'post-productivist' systems.⁸

A few historians have begun to adopt a more critical stance. They have analysed how and why industrial values took hold in agriculture,⁹ and shown that farmers' resistance to them was not confined to the marginal, organic movement.¹⁰ They have also stressed the vitality of small-scale production.¹¹ Their work is informed by a broader revisionist approach to industrialization in general. Questioning the central role traditionally awarded to mass production in the development of industrial modernity and efficiency,¹² historians have demonstrated, in various industrial, local and national settings, the variety and complexity of pathways to industrialization.¹³ However, perhaps due to the belief that 'agriculture itself is not a proper industry',¹⁴ such insights have not been applied to the history of British farming. While some authors have identified significant inter-war attempts to modernize,¹⁵ they have not challenged the dominant narrative of post-war transformation through industrialization.

⁸ While they engage closely with the nature, extent, and even the existence of post-productivism, authors do not subject productivism to a similarly critical analysis. G. A. Wilson, 'From Productivism to Post-productivism... and Back Again? Exploring the (un)changed Natural and Mental Landscapes of European Agriculture', *Transactions of the Institute of British Geographers*, 26 (2001), 77–102; H. Buller and C. Morris, 'Farm Animal Welfare: A New Repertoire of Nature-society Relations of Modernism Re-embedded?', *Sociologia Ruralis*, 43 (2003), 216–33; N. Walford, 'Productivism is Allegedly Dead, Long Live Productivism: Evidence of Continued Productivist Attitudes and Decision-making in South East England', *Journal of Rural Studies*, 19 (2003), 491–502.

⁹ D. Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (London, 2003); B. Orland, 'Turbo-cows: Producing a Competitive Animal in the Nineteenth and Early Twentieth Centuries', in S. R. Schrepfer and P. Scranton (eds), *Industrializing Organisms: Introducing Evolutionary History* (New York, 2004), 167–90.

¹⁰ M. Finlay, 'Hogs, Antibiotics and the Industrial Environments of PostWar Agriculture', in Schrepfer and Scranton (eds) *Industrializing Organisms*, 237–60; B. Theunissen, 'Breeding Without Mendelism: Theory and Practice of Dairy Cattle Breeding in the Netherlands 1900–50', *Journal of the History of Biology*, 41 (2008), 637–76.

¹¹ P. H. Kristensen and C. F. Sabel, 'The Small-holder Economy in Denmark: The Exception as Variation', in C. Sabel and J. Zeitlin (eds), *Worlds of Possibilities: Flexibility and Mass Production in Western Industrialisation* (Cambridge, 1998), 344–78.

¹² D. Landes, *Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge 1969).

¹³ C. Sabel and J. Zeitlin, 'Historical Alternatives to Mass Production: Politics, Markets and Technology in Nineteenth Century Industrialization', *Past and Present* 108 (1985) 133–76; Sabel and Zeitlin (eds), *Worlds of Possibilities*; P. Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865–1925* (Princeton 1997).

¹⁴ P. Palladino, 'Science, Technology and the Economy: Plant Breeding in Great Britain, 1920–70', *Economic History Review* 49 (1996) 117.

¹⁵ J. Thirsk, *Alternative Agriculture: A History from the Black Death to the Present Day* (Oxford, 1997); P. Brassley, 'British Farming Between the Wars', in P. Brassley, J. Burchardt and L. Thompson (eds), *The English Countryside Between the Wars: Regeneration or Decline?* (Woodbridge, 2006), 187–99; J. Martin, 'The Structural Transformation of British Agriculture: The Resurgence of Progressive High-input Arable Farming', in B. Short, C. Watkins and J. Martin (eds), *The Front Line of Freedom: British Farming in the Second World War* (Exeter, 2007), 16–35.

This article poses such a challenge, using pig production as a case study.¹⁶ It begins with the movement towards 'open-air' systems of pig-keeping that emerged around the time of the First World War, and extends to the 1960s expansion of indoor, intensive methods that were critiqued by *Animal Machines* and the subsequent government-appointed Brambell Committee on the Welfare of Animals kept under Intensive Livestock Husbandry Conditions.¹⁷ The first half of the article reveals that far from a single post-Second World War shift from traditional to modern farming, indoor 'factory-style' production was already established by the 1930s. Its fortunes waxed and waned over time in relation to different kinds of outdoor production, which was still prominent in the mid-1960s. The proponents of both types of system regarded them as 'modern' and 'efficient', although they defined and pursued these values in quite different ways. This finding suggests the need for a more historically situated understanding of agricultural modernity.

The second half of the article shows that regardless of their preferred production system, many farmers and experts were keen to develop what they considered to be natural methods that met the pig's natural needs and desires. This is a significant finding because it contradicts received accounts of how modern agriculture impacted on human-animal relationships. Authors have generally argued that whereas pre-modern farmers regarded animals as sentient individuals and worked in harmony with them, their modern counterparts employed science and technology to dominate nature and transform animals into standardized industrial products.¹⁸ This article argues to the contrary: that respect for nature and a romantic, moral view of the pig did not simply pre-date or emerge in opposition to modern agriculture, but, rather, were integral to it.

¹⁶ Pigs rarely feature in histories of twentieth-century agriculture. The few dedicated accounts address earlier periods, or focus on the pig's cultural significance: J. Wiseman, *A History of the British Pig* (London, 1986); R. Malcolmson and S. Mastoris, *The English Pig: A History* (London, 1998); C. Fabre-Vassas, *The Singular Beast: Jews, Christians and the Pig* (New York, 1997); L. Watson, *The Whole Hog: Exploring the Extraordinary Potential of Pigs* (London, 2004). The exception is Finlay, 'Hogs', which describes mid-twentieth-century production in the USA.

¹⁷ Cmnd 2836, Report of the technical committee appointed to enquire into the welfare of animals kept under intensive livestock husbandry conditions, *Parliamentary Papers* iv (1965–66).

¹⁸ J. Serpell, *In the Company of Animals: A Study of Human-Animal Relationships* (Oxford, 1986); K. Eder, *The Social Construction of Nature: A Sociology of Ecological Enlightenment* (London, 1996); A. Frankin, *Animals and Modern Cultures: A Sociology of Human-Animal Relations in Modernity* (London, 1999); B. Rollin, 'The Ethics of Agriculture: The End of True Husbandry', in M. Dawkins and R. Bonney (eds), *The Future of Animal Farming: Renewing the Ancient Contract* (Oxford, 2008).

Few detailed statistics or reports of pig production exist for this period. Consequently, my reconstruction of the values, methods, and contexts of production is largely qualitative and literature based. Key sources include books on pig production written by and for producers, vets and husbandry experts; the monthly *Journal of the Ministry of Agriculture*, in which state-sponsored researchers presented their findings for a general audience; the farming magazines, *Farmer and Stockbreeder* and *Pig Farmer*, which contained advertisements, news, advice, correspondence, and studies of successful farmers;¹⁹ and the *Veterinary Record*, read by the majority of the veterinary profession.

The products (including pigs) that were advertised in this literature, and the ways in which advertising changed over time indicate the shifting methods and values of pig production. Correspondence columns illustrate contentious issues, while research reports reveal the problems encountered within different production systems, and scientists' approaches to solving them. The news and advice literature offers insights into the political and agricultural contexts of production, scientific and technical advances, and perceptions of 'best practice'. The same authors feature in multiple publications. Some were husbandry experts and vets, who also performed research, advised producers, and the government, and participated in agricultural education and extension. Others were pedigree breeders or commercial producers involved in devising and trialling new methods on their farms. All were deeply involved in pig production. They were mature in years and had experienced multiple production methods. Their visibility, authority, and close connection with the pig world suggest considerable capacity to both describe and reshape producer, expert, and government approaches to pig production.²⁰

Critical analysis of this material reveals that pig production methods over the period 1910–65 can be divided roughly into three types: traditional, sty-based systems (Fig. 1); indoor or 'factory-style' systems, in which pigs were housed in large numbers for the majority of their lives (Fig. 2); and outdoor systems in which pigs were kept mainly outside (Fig. 3). Although these categories were used by actors, the distinctions between them were not always clear cut. All pigs required some form of housing; many indoor fattening houses incorporated exercise yards or outdoor pens; farmers could move pigs indoors and

¹⁹ *Farmer and Stockbreeder* was the most popular weekly farming magazine. The specialist monthly, *Pig Farmer*, began publication in 1955.

²⁰ There is no evidence of a hierarchy of expertise between scientists and progressive producers. This suggests that historians may have over-emphasized the innovations of the former, and neglected the latter's contribution to changes in twentieth-century farming practice.



Figure 1.

A model village pig club, 1944. Farmer and Stockbreeder collection, held by Museum of English Rural Life, University of Reading.



Figure 2.

Fattening house at Frilford Farms Ltd, 1959. Farmer and Stockbreeder collection, held by Museum of English Rural Life, University of Reading.



Figure 3.

Outdoor pig-keeping, with open-ended huts and free ranging within electric fences. Farmer and Stockbreeder collection, held by Museum of English Rural Life, University of Reading.

outdoors at different stages in their lifecycles; and both indoor and outdoor production incorporated a wide variety of housing types. Nevertheless, this broad categorization is useful in analysing the goals and methods of pig production and their change over time.

1. 'Modern' pig farming, 1910–39

At the turn of the twentieth century, pigs were low status and ubiquitous animals, 'the small man's livestock'. Kept in small wooden sties with outdoor pens, they converted waste produce into meat that sustained families through the winter. In urban areas they consumed household refuse, while on arable holdings, market gardens, and dairy farms, they ate arable by-products, surplus produce, and skimmed milk, respectively. Cereal residues from brewing and milling were also fed, and pig manure used to fertilize crops. Pigs were therefore integral to mixed farming systems. Unlike flocks of sheep and herds of cows, they did not form a 'livestock unit' in their own right, and their

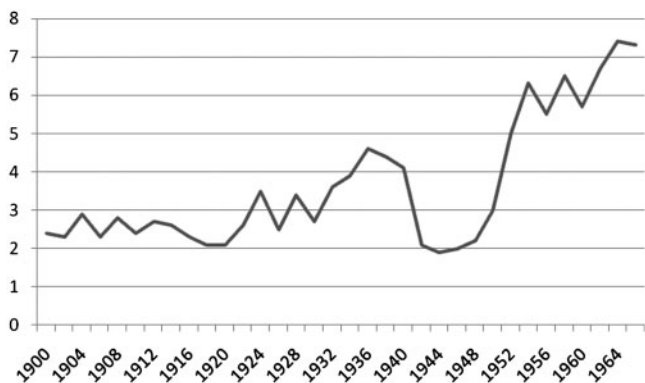


Figure 4.

British pig population (millions), 1900–66. H. F. Marks and D. K. Britton, *A Hundred Years of British Food and Farming: A Statistical Survey* (London, 1989), 215.

economic contribution to the farm was rarely scrutinized. Most were sold for bacon curing, which took place in specialized factories. Lighter carcasses were sold for pork. Prices—and pig numbers—were subject to fluctuations known as the ‘pig cycle’ (Fig. 4), which lasted 4–5 years. High prices caused producers to breed more pigs. Short pregnancies and large litters²¹ quickly resulted in a glut, which depressed prices and production levels. This volatility inspired the saying that pigs were either ‘copper or gold’, or alternatively, ‘muck or money’.²²

There were many local breeds of British pig and their relative merits were fiercely debated. Founded in 1884, the National Pig Breeders Association fostered breed improvement. Echoing developments in pedigree cattle and horse breeding,²³ it maintained pedigree herd books, held shows in which pigs were evaluated on lineage and appearance, and attracted aristocratic interest.²⁴ Most producers, however, kept cross-bred or ‘mongrel’ pigs. In the absence of market

²¹ Pig pregnancies lasted three months, three weeks and three days. Litters numbered up to 12 piglets, though pre-weaning losses were high. A target of fourteen weaned pigs per sow per year was suggested by R. Biffen, *Fream's Elements of Agriculture* (12th edn, London, 1932), 570.

²² H. R. Davidson, *The Production and Marketing of Pigs* (London, 1948), 14–23; D. B. Bellis, ‘Pig farming in the United Kingdom – Its Development and Future Trends’, *Journal of the Royal Agricultural Society of England*, 129 (1968), 24–42.

²³ J. R. Walton, ‘Pedigree and the National Cattle Herd c.1750–1950’, *Agricultural History Review*, 34 (1986), 149–70; H. Ritvo, *The Animal Estate* (Cambridge, 1987).

²⁴ The British Pig Association, ‘A History of the British Pig Association’ <<http://www.britishpigs.org.uk/history1.htm>> accessed 7 April 2011.

incentives, they paid little heed to the consumer preference for lean bacon from white pigs, instead producing 'short, thick, coarse hogs, with an abundance of back fat'.²⁵

From 1910, some pedigree breeders called for improvement in the practices of pig production. One of the key drivers to this, and subsequent calls for change was the perceived need to compete more effectively with imported Danish bacon. Following a crisis of grain sales in the later nineteenth century, Danish agriculture had diversified into dairying, with pig production forming a useful outlet for skimmed milk by-products. Most producers were smallholders, and co-operation was institutionalized, which facilitated innovation. They improved the home-grown Landrace pig through breeding programmes, and developed indoor housing to protect pigs from the weather and restrict their exercise, thereby maximizing growth rates. Bacon factories were run co-operatively under strict quality control. The best, most uniform carcasses were sent to Britain, where their low price, reliability, and lean composition proved attractive to consumers.²⁶

In a flood of texts and magazine articles, pedigree breeders argued that British pigs' constitutions had been undermined by keeping them in old-fashioned, unhealthy, cramped sties. To increase profitability and competitiveness, producers should adopt an 'improved', 'rational', 'modern', and 'scientific' system of 'open-air' pig keeping. Pigs should be placed outdoors on pasture or folded on arable crops, with shelters or huts provided for night-time use only.²⁷ Exposure to fresh air, soil, sunlight, and a rational diet that included the newly discovered vitamins would result in a 'herd practically immune from disease...making pig-keeping a more certain and profitable undertaking'.²⁸ Outdoor pigs increased crop yields by distributing their manure over the land, while their freedom to exercise resulted in the leaner carcasses desired by bacon factories and consumers. They required less purchased feed—which made up 80 per cent of production costs—and because more pigs could be kept by this method than in sties, British producers could meet a greater proportion

²⁵ T. E. Robinson, 'English Versus Danish Pigs for Bacon', in *Outdoor Pigs: How to Make Them Pay*, by the leading authorities on modern pig keeping (London, 1923), 107.

²⁶ E. B. Shaw, 'Swine Industry of Denmark', *Economic Geography*, 14 (1938), 23–37; Danish Agricultural Organisation, *Danish Agriculture: Denmark as a Food Producer* (Copenhagen, 1954); Kristensen and Sabel, 'The Smallholder'.

²⁷ T. Allen, *Profitable Pig Breeding and Feeding* (London, 1910); R. D. Garrett, *Practical Pig-Keeping: A Manual for Amateurs* (3rd revised edn, London, 1911); S. Edge, 'Pig Keeping that Pays', *Farmer and Stockbreeder* (hereafter *F&S*), 32 (1919), 94; Anon., 'Introduction', and F. Bonnett, 'The Outdoor Pig', in *Outdoor Pigs* by the leading authorities, 1–16, 17–28; H. P. Jacques, *Modern Pig Keeping* (London, 1924).

²⁸ Jacques, *Modern Pig Keeping*, 11.

of domestic demand. Advocates backed up their claims of profitability by calculating the quantity and cost of feed required to fatten an outdoor pig from weaning to bacon weight.²⁹

The First World War food production campaign provided an additional rationale for moving from sty production to open-air pig farming. Cereal-based pig feed grew scarce and expensive as crops were reserved for human consumption, brewing was curtailed, and the extraction rate of flour increased. Pig numbers dropped (Fig. 4) and the price of bacon soared. Producers sought alternatives to purchased feed by turning their pigs out to graze on kale, turnips, and the post-harvest stubble of an expanded arable acreage. Post-war, when prices of feed and bacon remained high, open-air production was taken up by returning servicemen. It continued to make economic sense in the early 1920s, when the 'pig cycle' resumed and pig prices slumped relative to feed costs.³⁰

From the mid-1920s, negative experiences of outdoor production, improved indoor methods, nutritional research, and the deepening agricultural depression caused the open-air system to fall out of favour. Critics complained that in winter, permanent pig paddocks 'put you in mind of the trenches'.³¹ Fattening pigs were more comfortable and also more profitable when kept indoors.³² They needed less feed than outdoor pigs because they exercised less and slept more. Moreover, their cereal-based feed was easier to digest and turn into flesh than the fibrous greenstuffs eaten by outdoor pigs.³³ Labour costs—which were increasing relative to produce prices—were also lower indoors.³⁴

These observations did not deter the majority of pig breeders from keeping breeding sows, and often their suckling litters, outdoors. Convinced that exercise and fresh food were needed to maintain sow fertility and constitutional strength, they devised new methods of portable housing, feeding, and pig tethering to reduce costs and

²⁹ Allen, *Profitable Pig Breeding*; Edge, 'Pig keeping', 94; Bonnett, 'The Outdoor Pig', 8; There was a parallel inter-war movement to open-air dairy farming, promoted by Wiltshire producer, A. Hosier, who devised the movable bail milking machine. Brassley, 'British Farming'.

³⁰ Anon., 'Open Air Pigs', *F&S* 34 (1921), 38; P. Dewey, 'British Farming Profits and Government Policy During the First World War', *Economic History Review*, 37 (1984), 373–90. The uptake of open-air production contradicts Holderness's claim that 'no fundamental reorientation in the management of the pig was attempted before the 1920s'. E. Collins (ed.), *The Agrarian History of England and Wales* vol. 7, 1850–1914 (Cambridge, 2000), 490.

³¹ R. Morrison, *The Individuality of the Pig: Its Breeding, Feeding and Management* (London, 1926), 187.

³² Ministry of Agriculture and Fisheries, *Pig Keeping: Bulletin No 32* (5th edn, London, 1938).

³³ C. Crowther, 'Indoor v Outdoor Pig Feeding', *F&S*, 36 (1923), 313

³⁴ Morrison, *Individuality of the Pig*.

ensure access to fresh, clean pasture.³⁵ However, the indoor housing of fattening pigs was increasingly favoured. This did not imply a return to sty-keeping. Instead, pigs were kept in pens and covered yards converted from existing farm buildings, or in large, purpose-built, Danish-style fattening houses containing a double row of pens separated by feeding and dunging passages. Many were fed solely on purchased feed, which grew cheaper as cereal prices plummeted.³⁶ Contemporaries described these fattening houses as a factory operation, 'run on the continuous process system used in mass production'.³⁷

Advocates of indoor fattening viewed it as a modern, efficient, and profitable method that was needed to compete with the rapidly increasing volume of Danish imports (Fig. 5). However, their methods of assessing and pursuing efficiency were quite different from those of open-air advocates. The latter saw environmental challenge as a means of developing strong, robust pigs, whereas the former protected pigs from the elements in order to increase fattening rates. Open-air producers operating mixed farms adjusted pig production in accordance with market prices, relying on alternative revenue streams in years when pigs were more 'muck' than 'money'. This was not possible for indoor producers. However, by keeping pigs as a separate 'department' or even as a specialist enterprise, they could pursue efficiency through accounting methods devised by the new field of agricultural economics.³⁸

Aided by husbandry experts, progressive indoor producers extended existing measurements of efficiency (based on food consumed to bacon weight) into a voluntary, county-based system of pig recording modelled on dairy farmers' milk recording schemes. Participants recorded numbers of pigs per litter, litter frequency and weight, rate of growth, feed consumed, and carcase quality. The constitutional strength valued by outdoor producers was not recorded because it could not be quantified. Data were used to identify, for future breeding purposes, prolific sows that produced rapidly growing, early maturing offspring

³⁵ H. E. Shand, 'Tests on Tethered Sows', *F&S*, 49 (1935), 89; H. R. Davidson, 'Clean Ground for Pigs', *F&S*, 49 (1935), 247; S. McGuckian, 'Housing for Health in Pig Production' (1948), reprinted in A. E. Muskett (ed.) *A. A. McGuckian: A Memorial Volume* (Belfast, 1956), 25–34.

³⁶ W. Glossop, 'Planning the Pig Department', *F&S*, 47 (1933), 1383; R. Rae, 'Piggeries at the Agricultural Research Institute for Northern Ireland', *Journal of the Ministry of Agriculture* (hereafter *J Min Ag*) 41 (1934–5), 229–39; Bellis, 'Pig Farming'.

³⁷ Special correspondent, 'Pigs on Factory Lines', *F&S*, 51 (1937), 789. The phrase 'farming along factory lines' dated from at least 1917, when Irish agricultural extension lecturer, Thomas Wibberley, applied it to his system of continuous cropping. As in factory production, Wibberley aimed for an even distribution of labour throughout the year, and for the use of labour saving machinery. T. Wibberley, *Farming Along Factory Lines: Continuous Cropping for the Large Farmer* (London, 1917).

³⁸ E. Whetham, *Agricultural Economists in Britain, 1900–56* (Oxford, 1981).



Figure 5.

Imports ('000 tonnes) of bacon and ham from Denmark. H. F. Marks and D. K. Britton, A Hundred Years of British Food and Farming: A Statistical Survey (London, 1989), 221.

with long, lean carcasses. Enthusiasts saw these measurements not simply as an assessment of breeding quality, but also of feeding and management. In this way, they enhanced their surveillance over pigs' bodies and, by extension, over the employees who cared for them.³⁹

From 1933, 'factory' production was boosted by operation of a new Pigs and Bacon Marketing Scheme. One of several marketing schemes devised by the state in response to agricultural depression, it aimed to improve the quantity, quality, and cost-effectiveness of domestic production through the creation of a stable market. Danish bacon imports were restricted and British producers contracted to supply bacon factories with a set numbers of pigs at defined intervals. This system favoured larger producers with a regular throughput. Instead of prices fluctuating week by week, a 'fair' price was agreed in advance, based on the estimated cost of production.⁴⁰ Since estimates were based on the average pig farm, producers of above-average efficiency could make large profits. Experts writing in the agricultural press told them how to achieve this goal by attention to feeding, management, and recording.⁴¹ Following the scheme's introduction, pig numbers rose

³⁹ 'Dorset', 'Weaning Pigs and Their Food', *F&S*, 38 (1925), 786; Anon., 'Linking up Commercial Pig Interests', *F&S*, 40 (1927), 759; Biffen, *Fream's Elements*; G. H. Garrad, 'Pig Recording Means Efficiency', *F&S*, 47 (1933), 299; Davidson, *Production and Marketing*, 338; Bellis, 'Pig Farming'.

⁴⁰ Editorial, 'The Pig Industry', *Veterinary Record* (hereafter *VR*), 49 (1937), 1114–15; Davidson, *Production and Marketing*; Bellis, 'Pig Farming'.

⁴¹ Garrad, 'Pig Recording'; H. R. Davidson, 'Raising Fecundity in Pigs', *F&S* 47 (1933), 351; Glossop, 'Planning'.

rapidly (Fig. 4), and Danish imports declined (Fig. 5). British producers' share of the market increased from 37 per cent to 49 per cent.⁴²

One consequence of the growth of indoor production, particularly in Danish houses, was a decline in pig health. This undermined the efficiency and profitability of production. While free from worm infestation—the 'terrible scourge' of outdoor production—indoor pigs suffered more frequently from scouring (diarrhoea) and respiratory disease, and developed new diseases like anaemia.⁴³ Coughing was reportedly ubiquitous,⁴⁴ and 'all the large breeding establishments get trouble sooner or later'.⁴⁵ In 1933, the new Agricultural Research Council (ARC)'s committee on pig diseases warned that: 'lack of attention to disease factors which are accentuated by increasing density of pig populations and increasingly intensive methods of pig rearing may well nullify the efforts to foster home production'.⁴⁶ Meanwhile, veterinary investigations exploded the belief that Danish fattening controlled the environment. Rather, conditions fluctuated wildly, undermining pig health.⁴⁷ Solutions included placing sick pigs in the open to recover,⁴⁸ or rearing young pigs on pasture in order to build constitutions capable of resisting the pressures of the fattening house.⁴⁹

2. 'Modern' pig farming, 1939–65

The Second World War precipitated a dramatic shift away from specialist indoor production in favour of pigsties. The need to preserve scarce shipping space reduced imports of human and livestock food and led to the rationing of both. Pigs were allocated only a small ration of concentrates, which owners had to supplement with roots, potatoes,

⁴² Nevertheless, the scheme was not a success. Many farmers preferred to sell pigs on the open market. Supplies to bacon factories via the scheme were too low for them to work at capacity. Consequently, they were forced to buy more pigs on the open market, often at higher prices, which encouraged more producers to opt out of the scheme. Editorial, 'The Pig Industry'.

⁴³ D. J. Anthony, 'Some Notes on Swine Practice', *VR*, 47 (1935), 75–84; V. C. Fishwick, 'The Management of Growing Pigs: Outdoor v Indoor Systems', *J Min Ag*, 42 (1935–6), 345–52; H. G. Lamont, 'The Problems of the Practitioner in Connection with the Differential Diagnosis and Treatment of Diseases in Young Pigs', *VR*, 50 (1938), 1379–400.

⁴⁴ The National Archives: Public Record Office, Kew (hereafter TNA: PRO), Ministry of Agriculture and Fisheries (hereafter MAF) 33/71, W. T. Price and A. W. Ling, 'Pig Husbandry: An Investigation Conducted in the SW of England' (1935–6).

⁴⁵ TNA: PRO, MAF 33/710, W. H. Andrews, 'Minute' (20 April 1934).

⁴⁶ ARC Pig Diseases Committee, *First Interim Report* (1933), NA MAF 33/720. The ARC was founded in 1931 to allocate state funds for agricultural research. T. DeJager, 'Pure Science and Practical Interests: The Origins of the ARC, 1930–37', *Minerva* 13 (1993), 129–51.

⁴⁷ P. Shanks, 'The Housing of Pigs', *VR*, 54 (1942), 233–35.

⁴⁸ Fishwick, 'Management of Growing Pigs'.

⁴⁹ McGuckian, 'Housing'.

green food, and household scraps. Without sufficient land to grow this food, many specialist producers went out of business and UK pig numbers dropped by 65 per cent.⁵⁰ Small-scale production took place on mixed farms and on waste land in urban areas, where newly formed pig clubs used boiled swill from local institutions to fatten pigs in sties or converted buildings. The health problems that had undermined efficiency on indoor fattening units were replaced by worms and digestive complaints arising from a change in feed.⁵¹

In wartime, efficient pig production took on new meanings and new urgency. Market conditions changed as the government suspended the marketing scheme and required all pigs to be sold at set prices to the Ministry of Food. Competition from Danish imports ceased with the German occupation (Fig. 5). Efficient pig production now meant making the best use of available resources, not simply for farming profits but to feed the nation, and maintain its morale and fighting capacity. Carcase quantity was more important than quality, and nutritional value took precedence over consumer preference. Since young pigs had to be fed on scarce cereal concentrates but older ones could survive on bulky feeds, pigs were fattened to heavier weights and the ungraded carcasses used for both pork and bacon. Scientists facilitated this move by investigating the feeding values of different types and mixtures of feedstuffs.⁵²

After the Second World War and the hard winter of 1946/7, just 1.3 million pigs were left in the UK. Meat was in short supply, so although Denmark had resumed exports (Fig. 5), domestic production was heavily subsidized to encourage increased output.⁵³ But should farmers expand their wartime practice of a few pigs on every farm, or return to intensive indoor fattening? The Ministry of Agriculture favoured the former: farms had sufficient resources to increase pig numbers to pre-war levels, and pigs would bring much-needed fertility to the exhausted soil. Wiltshire bacon curers objected on the grounds that heavy, fat pigs produced poor quality bacon. However, a return to specialist production was impeded by currency restrictions that limited pig food imports, memories of inter-war health problems, and a shortage of building materials.⁵⁴ Consequently, the trebling of pig meat

⁵⁰ K. Murray, *The History of the Second World War: Agriculture* (London, 1955); Martin, *The Development of Modern Agriculture*.

⁵¹ J. O. Powley, 'Diseases of the Pig with Reference to War-time Conditions', *VR*, 54 (1942), 236–8; J. Blair, 'The Problems of Pig Clubs in War-time', *VR*, 55 (1943), 445–8.

⁵² W. A. Stewart, and V. C. Fishwick, 'Pig Keeping in War Time', *J Min Ag*, 46 (1939–40), 627–33; Murray, *The History*; Bellis, 'Pig Farming'.

⁵³ N. Tinley, *Good Pig Keeping* (London, 1947).

⁵⁴ H. R. Davidson, 'Future of Bacon Production', *F&S*, 63 (1949), 579; Editorial, 'Pigs and Pig Production', *VR*, 63 (1951), 98; H. R. Davidson, 'The Breeding, Housing and General Management of Pigs', in Ministry of Agriculture and Fisheries (ed.), *Pig Husbandry* (London, 1951), 1–6.

production between 1948 and 1954 (Fig. 4) resulted mainly from wartime methods and concepts of efficiency. By using surplus labour and accommodation at a time of high market prices, producers kept their costs low and turned a quick profit.⁵⁵

Subsequent years saw the return and expansion of specialist factory-style production. The state played an important, albeit indirect role in its development. After paying out £40 million—or 20 per cent of its entire agricultural subsidy budget—to pig producers in 1954,⁵⁶ it announced that future support would be directed towards improving the quality, not the quantity, of pig production.⁵⁷ Under the 1957 Agriculture Act, it set subsidies at levels that failed to compensate farmers for their rising costs.⁵⁸ This ‘cost price squeeze’ encouraged the hunt for efficiency savings. By moving from mixed farming to specialist pig production, producers could achieve economies of scale, and use purchased feed, housing, drugs, and machinery in place of expensive labour. The Act also made available loans for the erection of specialist fattening houses, and established a Pig Industry Development Authority (PIDA) ‘to draw up and put into effect a programme for securing technical improvements in the whole field of pig production’.⁵⁹

Funded by a producer levy, PIDA commissioned research on pig health, nutrition, and husbandry, and appointed advisors to assist pig producers. Its activities prioritized the problems of intensive production. It also took over a national pig recording scheme, established in 1954 by the National Pig Breeders’ Association (NPBA).⁶⁰ Incorporating the benchmarks of inter-war recording, this scheme enabled producers to send the progeny of promising pigs to a central testing station where their performance was assessed and compared under constant conditions. It attempted to isolate the effects of genetics from feeding and management, and to develop a nationwide standard of efficiency.⁶¹ However, some producers rejected it, claiming that all pigs were not equal, and that different types thrived under different rearing conditions.⁶²

Indoor pig production was further encouraged—especially in the arable areas of the eastern counties—by the doubling of cereal

⁵⁵ D. S. Thornton, ‘Why Not All-year-round Farrowing?’ *Pig Farmer* (hereafter PF), 3 (1956), 53.

⁵⁶ Martin, *Development of Modern Agriculture*.

⁵⁷ Cmnd. 9406, ‘Agriculture Act, 1947: Annual Review and Determination of Guarantees’, *Parliamentary Papers* (1954–55), xii, 167.

⁵⁸ Martin, *Development of Modern Agriculture*.

⁵⁹ TNA: PRO, MAF 194/440, H. Bannister, ‘Draft Notes for Setting up PIDA’ (1956).

⁶⁰ C. James, ‘What’s Going to Happen to Pig Recording?’ PF 6(8) (1958), 43.

⁶¹ TNA: PRO, MAF 189/932-6, PIDA, ‘Minutes of Veterinary Advisory Committee’ (1958–62); PIDA, *Annual Reports* (London, 1957–67).

⁶² Anon., ‘Landrace Progeny Test Results’, PF, 6 (1958), 35.

production, which reduced producers' reliance on feed imports. Meanwhile, new antibiotics, vaccines, growth promoters, and disease eradication techniques were used to counter resurgent health problems.⁶³ Led by a handful of progressive, business-minded breeders like Stephen Horvat⁶⁴ and Geoffrey Johnson, it became a specialized 'factory procedure of the conveyor-belt type, with feeding stuffs coming in at one end and pigs going out at the other'.⁶⁵ Like their predecessors, they aimed for efficiency and profitability, which to them meant producing uniform carcasses of Danish quality. Pigs were selected on the basis of recording, bred increasingly from artificial insemination, and fed by specialist companies. Feed and pharmaceutical companies, whose revenues depended on pig production, provided indirect support for indoor production by researching the various factors that could undermine productive efficiency, and disseminating the results.⁶⁶ Producers also innovated, discovering what worked from experience and reporting their findings in the farming press.⁶⁷

Despite the shift towards specialist, indoor production, many producers and scientific experts remained convinced that breeding pigs were best kept in huts on pasture, where exercise, sunlight, and fresh green food would strengthen their constitutions and fertility. Meanwhile, the outdoor fattening of pigs on mixed farms, and the associated definition of productive efficiency, were boosted by new cutting techniques pioneered by the Walls' meat company in the 1950s. These enabled heavy, ungraded pig carcasses derived from wartime feeding methods to be cut up to produce Wiltshire bacon, pork, and processed meat products sold by the growing supermarkets.⁶⁸ This flexible, 'modern' approach to pig production adapted factory processing to the pig. At the same time, research and breeding programmes instituted by Walls adapted the pig to the factory, by identifying the types most suited to heavy hog production and selling them to producers.⁶⁹ Economic analysis suggested that this method was just as profitable as specialist bacon or pork production.⁷⁰ It proved

⁶³ J. W. Reid, D. E. Tribe and H. F. Hebeler, Papers Presented to BVA Congress on the Rearing, Nutrition and Diseases of the Pig, VR, 66 (1954), 862–78.

⁶⁴ S. Horvat, 'Secrets of Success in Pig Keeping', PF, 8 (1959), 39.

⁶⁵ G. Johnson, *Profitable Pig Farming* (Ipswich, 1959), 22.

⁶⁶ W. Wooldridge, 'The Contribution of the Feeding-stuffs Trade to Health on the Farm', VR, 71 (1959), 2–5; Bellis, 'Pig Farming'; P. Brassley, 'Cutting Across Nature? The History of Artificial Insemination in Pigs in the United Kingdom', *Studies in the History and Philosophy of Biological and Biomedical Sciences*, 38 (2007), 442–61.

⁶⁷ Anon., 'They Pointed the Way to More Profit Per Pig', PF, 7 (1959), 49–50; Johnson, *Profitable Pig Farming*; S. Horvat, 'The Economics of Husbandry and the Disease Pattern in Pigs', VR, 76 (1964), 1181–9; M. Meredith, Interview with Abigail Woods (24 June 2009).

⁶⁸ Bellis, 'Pig Farming'; Godley and Williams, 'The Chicken'.

⁶⁹ Anon., 'High Profit Hybrids', PF, 12 (1964), 57.

⁷⁰ R. F. Ridgeon, 'Which Pays the Best?' PF, 8 (1960), 28.

particularly popular in South East England owing to the proximity of the Acton-based Walls factory.⁷¹

The plurality of post-Second World War pig production methods is revealed by the burgeoning book and journal literature. Articles on the health benefits of outdoor production⁷² appeared alongside advertisements for huts, shelters, and hurdles, pictures of outdoor pigs, and lists of prizes they had won in shows. Breeders advertised pigs 'bred and reared in the open', 'reared under the healthiest outdoor conditions', and bred for 'hardiness (will live outdoors all year round)'. From the later 1950s, these descriptions were increasingly supplemented by statistical measures of pig performance determined by recording. Column and advertising space was also devoted to new dietary preparations, antibiotic growth promoters, nutritional supplements, early weaning methods, discussions on fattening house design, and schemes for breed improvement and disease elimination.⁷³

Between 1957 and the 1964 publication of *Animal Machines*, the number of British farms with more than 50 breeding sows rose by 236 per cent, with a corresponding reduction in the numbers of 'cottagers pigs'. Most large farms pursued indoor fattening. However, while some saw this as the method of the future,⁷⁴ others felt 'the industry still has to make up its mind on the question of whether the large or small pig farm is the proper economic unit'.⁷⁵ The average herd still contained just 9.5 sows. A study by agricultural economist, David Jukes, concluded that large farms were not necessarily more efficient. He predicted that while larger farms would grow, there was no reason why herds of moderate size on mixed farms would be pushed out of production.⁷⁶ Pluralism in pig production seemed set to continue.

3. The pig in nature

This history of pig production reveals the need to modify existing historical portrayals of a rapid post-Second World War shift to large-scale, productivity-oriented, specialist factory farming. The factory farming of pigs pre-dated the Second World War and was disrupted by it. Intensification re-emerged in the later 1950s, but while increasingly popular, the industry of the mid-1960s was characterized by pluralism. Regardless of their preferred production system, most of the producers

⁷¹ D. Burch, Interview with Abigail Woods (31 July 2009).

⁷² K. Bolton, *Outdoor Pig Keeping* (Ipswich, 1954).

⁷³ *PF*, passim.

⁷⁴ G. Sykes, 'Pig Farmers – Think Big – or You're Doomed!', *PF*, 9 (1961), 39.

⁷⁵ A. Shaw, 'Marketing is Still the Big Problem', *PF* supplement, 8 (1960), 3.

⁷⁶ D. Jukes, 'Scale of Enterprise and Structural Change in British Pig Farming', University of Exeter, Department of Agricultural Economics, Report No. 164 (1967).

and experts writing on pigs during the first two-thirds of the twentieth century adopted efficiency as a goal, and advertised the modernity of their methods. But while they strove to produce a more standardized, predictable, efficient pig, this did not imply—as existing accounts suggest⁷⁷—a purely utilitarian attitude towards it. Rather, as the remainder of the article will demonstrate, they sought to work in harmony with nature, and in accordance with the pig's natural habits and desires.⁷⁸

Conceptions of nature and its place within pig production systems changed over time. Writing in the years around the First World War, early proponents of 'open-air' pig keeping saw nature as a beneficent force capable of restoring pig constitutions corrupted by cramped, unhygienic sties. Access to fresh air, soil, and sunlight, forage crops for grazing, and the space to exercise would help them develop into 'a healthier and hardier race'.⁷⁹ Such claims reveal an ambiguous attitude to modernity. While drawing on the recent scientific discovery of vitamins and the realization that sunlight could kill germs, they relied, also, on a pre-nineteenth-century conception of health as a balance between bodily constitution and environment that could be disrupted by inadequate feeding, ventilation, and hygiene.⁸⁰ While portraying open-air production as modern and profitable, they located its origins prior to the eighteenth-century enclosure acts, when villagers' pigs had been herded together on common ground, returning to their individual sties at nightfall. Subsequently, enclosure had confined pigs permanently to sties. Now, however, using hurdles and wire, it was possible to build enclosures in which pigs could roam once more.⁸¹

Elements of pig producers' beliefs in the restorative powers of nature, their holistic sense of interconnection between body and environment, and their harking back to a pre-industrial age, can be identified in concurrent thinking about human health, eugenics, and relationships with nature. Doctors alarmed by modern reductionist tendencies in medicine, and by reports that the human race was physically degenerating, emphasized healthy living and the healing power of nature. They were supported by the influential social Darwinist, Herbert Spencer, who argued in 1911 that human health merited the same care as the raising of animals. Attributing disease and

⁷⁷ Serpell, *In the Company*; Eder, *Social Construction*; Franklin, *Animals*; Holloway, 'What a Thing'; Rollin, 'The Ethics'.

⁷⁸ From the evidence examined, it is impossible to say whether this concern for the pig was a uniquely British phenomenon that reflected the nation's well-documented concern for animals.

⁷⁹ Bonnett, 'The Outdoor Pig', 17.

⁸⁰ C. Lawrence and G. Weisz (eds), 'Medical Holism: The Context', in *Greater Than the Parts: Holism in Biomedicine 1920–50* (Oxford, 1998), 1–24.

⁸¹ Bonnett, 'The Outdoor Pig'; Anon., 'Introduction'; Jacques, *Modern Pig Keeping*.

degeneration to the adverse effects of civilization, industrialization, and urbanization, they advocated a return to nature through outdoor exercise, pure food, and sunlight.⁸² Meanwhile, a 'back to the land' movement alarmed by modern, industrial society sought spiritual renewal through exposure to the English countryside. Its members included forerunners of the organic farming movement who resisted agricultural modernization and sought to rebuild society by reconnecting man to the soil.⁸³ While sharing similar beliefs about nature, pig producers' commitment to modernity, and commercialism conflicted with the values of medical holists and 'back to the landers'. This finding suggests that the inter-war drive to reconnect with nature was both more extensive and more complex a phenomenon than suggested by the existing literature.

With the declining popularity of the open-air system and the rise of indoor fattening, references to nature in pig production faded away. Comments were made only by organic farming advocates like Viscount Lymington, who argued in 1935 that indoor fattening was 'flying in the face of natural experience'. Pig-keeping should approximate to the pig's natural habits, and manufactured, concentrated food was no substitute for 'natural foods'. Instead of putting faith in vets and serums, farmers should breed sound strains of pigs in the most natural way.⁸⁴

During wartime, when indoor fattening gave way to small-scale, outdoor production, Lymington's views entered the mainstream. Vets discussing pig disease at the British Veterinary Association's 1942 congress referred frequently to 'nature' and 'artificiality' whereas just four years previously, these terms did not feature.⁸⁵ One speaker, J. O. Powley, remarked that:

The beneficial effect on rearing problems of adopting the outdoor system is now well understood. Nature endowed the pig with a

⁸² Anxieties were heightened by the prevalence of poor health and physique amongst military recruits during the Boer War (1899–1902). I. Zweiniger-Bargielowska, 'Raising a Nation of "Good Animals": The New Health Society and Health Education Campaigns in Interwar Britain', *Social History of Medicine*, 20 (2007), 73–89; Lawrence and Weisz, 'Medical Holism'; D. Porter, *Health, Civilisation and the State: A History of Public Health from Ancient to Modern Times* (London, 1999).

⁸³ F. Trentmann, 'Civilization and its Discontents: English Neo-Romanticism and the Transformation of Anti-Modernism in Twentieth Century Western Culture', *Journal of Contemporary History*, 29 (1994), 583–625; P. Mandler, 'Against Englishness: English Culture and the Limits to Rural Nostalgia, 1850–1940', *Transactions of the Royal Historical Society*, 6th series, 7 (1997), 155–75; P. Conford, 'Organic Society: Agriculture and Radical Politics in the Career of Gerard Wallop, Ninth Earl of Portsmouth (1989–1984)', *Agricultural History Review*, 53 (2005), 78–96.

⁸⁴ V. Lymington, 'The Breeding of Bacon Pigs', *J Min Ag*, 42 (1935–6), 19–24. Lymington—later the Earl of Portsmouth—was a right-wing advocate of the 'back to the land' movement, and helped to found Kinship in Husbandry, one of the precursors of the Soil Association. Conford, 'Organic Society'.

⁸⁵ Lamont, 'The Problems'.

snout with which to grout in the soil, thereby obtaining essential minerals and other substances to maintain health: outdoors also administered the beneficent [sic] sunlight. In our civilised way we try to rear the pig under artificial conditions...and are then surprised when disease rears its head.⁸⁶

A similar shift is evident in the language of the vet, D. J. Anthony. Whereas his frequent, pre-war commentaries on pig health made little reference to nature or artificiality, his 1940 book—the first dedicated text on pig diseases—criticized the tendency ‘to regard the pig as more of a machine than a live animal’. Warning of a vengeful nature who ‘exact[s] a penalty for any violation of her laws’, he argued that producers ‘must try to adopt scientific methods whilst still having due regard for Mother Nature’.⁸⁷

Unlike Lymington’s criticisms, this discourse cannot be seen as a simple backlash against modern, industrial farming. It emerged not when indoor fattening was at its peak, but during its wartime decline, and was voiced not by opponents of modern farming, but by those involved in its development. Its timing, portrayal of a vengeful nature, and references to ‘artificiality’ differed from the earlier open-air discourse, which viewed nature as helpful and used sty-keeping as its foil. This suggests that ‘natural’ and ‘artificial’ pig production emerged as oppositional constructs in response to the dual experiences of inter-war and wartime pig production.

In the post-war era, proponents of ‘pigs on every farm’ continued to advertise the naturalness of outdoor production and to moralize about the danger of breaking nature’s laws. By making the pig’s environment as close to nature as possible, they hoped to avoid the ‘inevitable crop of ailments attendant on artificial methods adopted in rearing and feeding of pigs on a large scale’.⁸⁸ Pig farmer and author, Ken Bolton, blamed such problems on:

a process of reckless and unplanned artificiality... We have taken a roaming, rooting, earth-loving, open-air animal and put him into a stuffy or draughty place with a concrete floor under him and concrete walls all round him – and wondered why we have come unstuck... This is pig-farming ‘civilisation’ gone mad. All those artificialities pile one on top of the other into an idiotic snowball.⁸⁹

Some veterinary commentators held similar views. Perceiving the body and the natural world to be inter-connected, self-regulating entities,

⁸⁶ Powley, ‘Diseases’, 236.

⁸⁷ D. J. Anthony, *Diseases of the Pig and its Husbandry* (London, 1940), 2.

⁸⁸ Anthony, *Diseases of the Pig*, v.

⁸⁹ Bolton, *Outdoor Pig Keeping*, 16.

they claimed that artificial husbandry and selection for growth and production upset the physiological balance.⁹⁰ 'In this artificiality, we are skating all the time on thin ice as we do not completely understand the nature of the laws that we are breaking nor can we foresee the new trouble that each fresh line of interference is likely to call forth.'⁹¹

These comments belie the existing literature's claims that wartime and post-war advances in science, medicine, and agriculture sidelined holistic conceptions of health, and confined neo-Romantic views of nature to marginal groups like the organic movement.⁹² The authors were not organic farmers who rejected artificiality on principle, but experienced producers and experts working towards productive efficiency. Having observed that pigs kept in small, supposedly 'backward', converted farm buildings often did better than those in large, state-of-the art pig houses,⁹³ they deduced that 'the further away they got from nature, the more likely they were to run into troubles'.⁹⁴ Bolton used recognized benchmarks such as numbers of piglets born and rate of growth to show that outdoor pigs were more productive than their indoor counterparts. While accepting that modern aids such as electric fencing and purchased feed had their place, it was 'as a help to nature and not as a substitute... what is wanted is the minimum interference with Nature consistent with the demands of domestication and general farming techniques'.⁹⁵

4. The natural pig

One of the difficulties in pursuing 'natural' pig production lay in deciding what was natural to the pig, for it was known to be 'a very accommodating creature' that could easily adapt itself to less than ideal conditions.⁹⁶ Open-air advocates claimed that the common perception of the pig as a dirty, greedy creature resulted from faulty husbandry: 'Man has made the hog a low, vulgar beast by the environment he has almost invariably imposed upon him.'⁹⁷ Confined to a sty, the pig

⁹⁰ F. G. Waddington, 'The Profession Today and Tomorrow', *VR*, 71 (1959), 435.

⁹¹ E. Taylor, 'Adverse Effects on Animal Health Brought About by Man's Interference with Nature', *VR*, 67 (1955), 1041.

⁹² Lawrence and Weisz, 'Medical Holism'; Mandler, 'Against Englishness'.

⁹³ D. Sainsbury, 'Comfort Before Cost', *PF*, 5 (1957), 45.

⁹⁴ K. Kelly, 'Contribution to Discussion on Pig Health and Husbandry', *VR*, 66 (1954), 877.

⁹⁵ Bolton, *Outdoor Pig Keeping*, 18.

⁹⁶ Davidson, *Production and Marketing*, 74.

⁹⁷ Allen, *Profitable Pig Breeding*, 62.

made its own wallow by upsetting water over dung, and rooted in the soil for food. Fed on slop, it rushed at the trough and gulped its food.⁹⁸ Without access to nature, it produced weak, sickly, infertile offspring. Open-air production resulted in a more robust animal,⁹⁹ but indoor fattening turned it into a frail and susceptible creature that 'more than any other farm animal is very much the victim of its environment'.¹⁰⁰

Complicating the definition and management of the 'natural' pig was the fact that 'the domestic sow exists... in a quite different environment from that of Nature... her natural functions are to a great extent subject to her owner's will'.¹⁰¹ Deciding what was a natural function and the extent to which it should be expressed were controversial issues informed by a mixture of humanitarian, utilitarian, and eugenic ideas. Debates over rooting and farrowing illustrate this point. For open-air advocate, Thomas Allen, 'rooting is one of those natural privileges we are bound in our own interests to ask Piggy to forego... the result is... annoying and destructive'.¹⁰² Others argued that rooting was unnatural, a response to dietary deficiency resulting from inadequate husbandry.¹⁰³ The solution was to supply the deficiency, not cause the pig to suffer by ringing its nose, for 'Who among us would grow fat if everything we ate caused us pain?... Every producer should run his pigs onto his tennis lawn every Saturday afternoon at 2 pm. If the lawn is still intact at tea-time he may say his pigs are well fed; if not, let him demand the head of his pig man on a charger'.¹⁰⁴ Husbandry expert, H. R. Davidson, disputed the connection between diet and rooting, arguing, 'The whole anatomy of the pig is suited to its mode of life in the wild state; in this state rooting in the ground is as natural to a pig as burrowing is to a mole... pigs root as a natural instinct in search of their food'.¹⁰⁵

Attendance at the 'natural' process of farrowing was equally controversial. Some commentators believed this essential to calm the sow and prevent her squashing the piglets.¹⁰⁶ Others argued that attendance permitted unsuitable pigs and their sickly offspring to survive. This contravened the goal of pedigree breeding, which was to produce 'fool-proof', commercial pigs that 'can go to anybody,

⁹⁸ Garrett, *Practical Pig-Keeping*; T. Stephens, 'Food and Feeding', in *Outdoor Pigs*, by the leading authorities, 58–72; Davidson, *Production and Marketing*, 71.

⁹⁹ Bonnett, 'The Outdoor Pig'.

¹⁰⁰ H. G. Lamont and D. Luke, 'Some Pig Diseases', *VR*, 62 (1950), 737.

¹⁰¹ Allen, *Profitable Pig Breeding*, 31–2.

¹⁰² Allen, *Profitable Pig Breeding*, 118.

¹⁰³ Bonnett, 'The Outdoor Pig'; Stephens, 'Food and Feeding'.

¹⁰⁴ S. Wilkin, 'Pigs Rooting', *F&S*, 34 (1921), 930.

¹⁰⁵ H. R. Davidson, 'Rooting in Pigs: A Habit Not Entirely Due to Diet Deficiency', *F&S*, 47 (1933), 1235.

¹⁰⁶ Allen, *Profitable Pig Breeding*, 31–2.

anywhere, and be good, thrifty mothers'.¹⁰⁷ Another justification for assistance was that in demanding larger, more frequent litters, 'we are asking more from the sow in captivity than one in a state of nature had to do'.¹⁰⁸ These discussions echoed concurrent, eugenic debates over preventive interventions in human health and reproduction: were they justified, or did they simply enable the unfit to survive and breed?¹⁰⁹ The topic continued to spark controversy after the Second World War, when some producers adopted rails or crates to restrain sows and prevent them overlying their young.¹¹⁰ Critics complained that they allowed weedy piglets to survive, with repercussions for future generations.¹¹¹

The nature of the pig was particularly important to those involved in the post-Second World War revival and extension of specialist indoor production. They were keen to maximize productive efficiency, and to avoid the problems that had beset their inter-war counterparts. Like the critics of indoor production they attributed such problems to 'artificiality'. With little scientific information available on the specific needs of the indoor pig,¹¹² they looked to the pig's nature for guidance.¹¹³ In this context, the natural and the artificial ceased to be oppositional constructs. Instead, the natural became a guide to the artificial, with indoor systems constructed in accordance with the pig's natural needs and habits. These were deduced from physiological characteristics (rapid growth, an omnivorous diet, and poor temperature regulation),¹¹⁴ and observations of health, performance, and habits under different husbandry conditions. Problems such as anaemia that were exclusive to indoor housing were retrospectively attributed to 'artificiality', and their prevention to behaviours—rooting, grazing, and foraging—that were subsequently defined as 'natural'.¹¹⁵

The pig's natural needs were also deduced from its living conditions in the wild, which could then be simulated.¹¹⁶ 'In the natural state, in constructing its den, the pig will give chief consideration to fresh air,

¹⁰⁷ E. W. Brooks, 'Sows at Farrowing Time', *F&S*, 41 (1927), 132.

¹⁰⁸ D. H. Thompson, 'Sows at Farrowing Time', *F&S*, 41 (1927), 234; Editorial, 'Sows at Farrowing Time' *F&S*, 41 (1927), 341.

¹⁰⁹ Porter, *Health*, 166–91.

¹¹⁰ MAFF, *Diseases of the Pig* (London, 1964), 2.

¹¹¹ A. R. Plowden, 'The Simpler the Better', *PF*, 5 (1957), 31.

¹¹² J. Inglis and A. Robertson, 'Hygienic Aspects of Pig Housing: A Review', *VR*, 61 (1949), 141–5.

¹¹³ MAFF, *Diseases*, 1–2.

¹¹⁴ N. Barron, *The Pig Farmer's Veterinary Book* (Ipswich, 1952), 1–6.

¹¹⁵ R. Braude and K. Mitchell, 'Nutritional Anaemia in Pigs', *PF*, 6 (1958), 27–9.

¹¹⁶ MAFF, *Diseases*, 1.

protection from draughts, a warm dry bed and freedom from excreta.¹¹⁷ 'Most animals, if allowed to live a natural life, choose their diet from a large variety of foods and thus escape any vitamin shortage.'¹¹⁸ Good quality feed, housing, and management would enhance the pig's 'natural resistance' to disease.¹¹⁹ Using these observations to guide indoor production would achieve 'a saving of food and labour and improved health and progress in the animal'.¹²⁰

The known habits of the wild pig formed a starting point for the committee, appointed by government in the aftermath of *Animal Machines*, to review the welfare of animals kept in intensive systems. Chaired by zoology professor Roger Brambell, it devoted particular attention—as did Harrison—to the most 'unnatural' system in use at the time, the sweat box. Popular in Northern Ireland, where it was believed to suppress respiratory disease, it involved the dense stocking of pigs in high-temperature, high-humidity houses. Overheated, and breathing air saturated with ammonia, pigs could do little but lie in their own faeces. The committee declared this system unsatisfactory, but stopped short of calling for a complete ban.¹²¹

Another feature of writings on pig production is the authors' perceptions of pigs as individuals who possessed both agency and sentience. While expressed most frequently by outdoor advocates like Bolton ('just how much can we let the sows manage their own affairs?',¹²²), this perception was shared by men deeply engaged in indoor production, such as Geoffrey Johnson—who wrote the first 'how-to' manual of factory farming—and David Sainsbury—a veterinary expert on pig housing. Displaying both humanitarian and utilitarian sentiments, they claimed that it was essential to pig well-being to treat them as individuals, and that for efficiency and profitability, systems must be designed with pig psychology and comfort in mind. 'The pig's needs must come first, then the stockman's, then questions of labour [and] economy.'¹²³ Labour saving devices like automatic feeding and mechanised cleansing should be viewed with caution because they reduced opportunities for observing pigs.¹²⁴

¹¹⁷ W. T. Price, 'Future for Pigs and Poultry', in Sir J. S. Watson (ed.), *Proceedings of Conference: Agriculture in the British Economy* (Brighton, 1957), 110.

¹¹⁸ J.A. Greenslade, *Modern Pig Breeding* (London, 1952), 76.

¹¹⁹ Johnson, *Profitable Pig Farming*, 192.

¹²⁰ Price, 'Future for Pigs', 110.

¹²¹ Other concerns included overstocking, slatted floors, restricted lighting, and the lack of exercise for sows kept in farrowing crates; see Cmnd. 2836, Report of the technical committee, 34–40.

¹²² Bolton, *Outdoor Pig Keeping*, 18.

¹²³ D. Sainsbury, *Pig Housing* (Ipswich, 1963), 20.

¹²⁴ Sainsbury, 'Comfort'; Horvat, 'Economics of Husbandry'; Johnson, *Profitable Pig Farming*, 43; N. Snell, 'Remember We're Dealing with Animals', *PF*, 9 (1961), 33.

Only by observing pigs could producers and stockmen learn their habits and desires. This was essential, for 'no real progress is possible in pig farming until the owner has learnt... the foibles of any breeding animals owned... [and] an understanding of their psychological make-up'.¹²⁵ 'If we study the pig's point of view, not only will the pig benefit but... also... the bank balance of the owner.'¹²⁶ Particular importance was awarded to the habits and desires of breeding pigs, probably due to their longevity, and contributions to the future of the herd.¹²⁷ When breeding, 'the pair should be allowed to indulge in any preliminary love-making and they should be left entirely alone until they separate of their own free will'.¹²⁸ 'Outdoor pigs should be left to make their own nest.'¹²⁹ 'Pigs will quickly learn their names... the use of a name when a sow is farrowing will also reassure.'¹³⁰ 'The dam... can usually be relied on to know what is best for her own young.'¹³¹

However, agency was not restricted to breeding pigs. As 'interesting, likeable animals',¹³² all pigs 'should be housed in such a way as to provide the features it would itself choose, namely warmth, comfort, cleanliness'.¹³³ Buildings should be robust, for 'there is nothing a pig enjoys more than an hour or so's demolition'.¹³⁴ When considering ventilation 'don't sniff the air at this level, get down alongside the pig and see how things are for it'.¹³⁵ 'Pigs should always be ready for their food and like little boys they should finish a meal feeling they could eat just a little more.'¹³⁶ They were 'extremely fond of warm potatoes and will all go for them eagerly as soon as they are put in the trough. Therefore there must be plenty of trough room for all the pigs to feed at the same time.'¹³⁷

Such pronouncements reveal that modern pig producers and their advisors did not simply view pigs as meat-making machines, but as individuals with 'natural' needs and habits. Their experiences, research, and writings gave rise to a variety of housing designs. Derived from an understanding of the 'natural' pig, many achieved commercial success

¹²⁵ A. James, *Modern Pig Keeping* (London, 1952), 83.

¹²⁶ W. T. Price, *Housing of the Pig* (Newport, 1953), 5.

¹²⁷ This was observed by R. Wilkie, 'Sentient Commodities and Productive Paradoxes: The Ambiguous Nature of Human-Livestock Relations in North East Scotland', *Journal of Rural Studies*, 21 (2005), 213-30.

¹²⁸ Barron, *Pig Farmer's Veterinary Book*, 25.

¹²⁹ Bolton, *Outdoor Pig Keeping*, 43-4.

¹³⁰ James, *Modern Pig Keeping*, 85.

¹³¹ MAFF, *Diseases*, 2.

¹³² Greenslade, *Modern Pig Breeding*, 8.

¹³³ Price, 'Future for Pigs', 110.

¹³⁴ James, *Modern Pig Keeping*, 50.

¹³⁵ D. Soutar, 'A Tribute from NE Scotland', in Muskett (ed.), *A. A. McGuckian*, 123.

¹³⁶ Greenslade, *Modern Pig Breeding*, 72.

¹³⁷ Johnson, *Profitable Pig Production*, 132.

years before scientists defined its exact space, air, temperature, and humidity requirements.¹³⁸ In this way, scientific definitions of the pig's needs developed from, rather than in defiance of, its 'natural' needs as embodied in modern production systems.

This article has demonstrated that contrary to the impression conveyed by existing histories of twentieth-century British agriculture, there was no smooth, unidirectional, post-Second World War transition from traditional to modern farming. Like the industries documented by the revisionist history of production literature,¹³⁹ agriculture followed multiple pathways to modernity. From 1910 to 1965, pig production methods underwent a series of shifts between traditional sty-keeping, factory-style methods, and outdoor systems. The adoption and abandonment of these methods was shaped by war, agricultural policy, the livestock economy, scientific insight, and personal experience.

To expert authors on pig production, both indoor and outdoor methods embodied, at different points in time, modern, efficient, and profitable production. However, their interpretation and pursuit of these values differed. In outdoor systems, efficiency meant making optimum use of existing food, land, housing, and labour to sustain a flexible mixed farming system, whereas specialist indoor systems aimed to maximize production through purchased inputs and the close monitoring and manipulation of the animal body. Outdoor producers sought efficiency through a healthy, robust pig, while their indoor counterparts saw protection from the elements as essential to rapid pig growth. These findings have two important implications. Firstly, they reveal the flaws in existing historical and sociological analyses, which tend to equate indoor factory production with modern, productivity-oriented farming, and outdoor methods with traditional or 'post-productivist' agriculture. Secondly, they highlight the importance of developing a historically situated understanding of terms like 'intensive', 'productivist', 'efficient', and 'modern.'

This article has also argued for the need to rethink the place of nature, and the relationships between humans and animals within modern farming systems. The utilitarian attitude to nature that is usually regarded as paradigmatic of modern agriculture was certainly present in the writings of pig producers and experts: given their emphasis on efficiency, it would be surprising if it was not. However, this attitude co-existed with a humanitarian outlook, and a desire to work in harmony with nature in general and the nature of the pig in

¹³⁸ Inglis and Robertson, 'Hygienic Aspects'; D. Soutar, 'Pig Housing in Relation to Health and Economy', *VR*, 65 (1953), 722–40; Sainsbury, *Pig Housing*.

¹³⁹ Sabel and Zeitlin, 'Historical Alternatives'; Sabel and Zeitlin (eds), *Worlds of Possibilities*; Scranton, *Endless Novelty*.

particular. Derived from experience and influenced by wider medical and cultural cross-currents, their views of nature changed over time, from a beneficent force to a moral corrective, to a basis for the development of successful, 'artificial' systems. By accommodating the nature of the pig—which included its habits, desires, and physical needs—within production systems, they sought to maximize both profits and pig well-being.

It could be argued that since factory farming did not dominate during the period under review, most of the authors cited were not writing about truly modern pig production. It was not until the 1970s that large indoor units took centre stage, breeding companies displaced individual pedigree breeders, and industry structures adopted their present-day form.¹⁴⁰ However, long before these developments, authors on pig production were describing their methods as modern. Consequently, one would expect their attitudes to the pig to accord with those commonly attributed to modernity. The fact that they do not suggests the need to rethink farmers' attitudes to animals and nature, and the ways in which they have been portrayed and criticized. In *Animal Machines*, Ruth Harrison accused producers of caring only about profits and productivity, not animal well-being.¹⁴¹ Their response was—and still is—that the two went hand in hand: treating animals humanely made them more productive and profitable.¹⁴² While frequently dismissed as special pleading, the findings presented here suggest that this was, in fact, their experience.

¹⁴⁰ T. Alexander, 'Changes in Pig Production in Britain and Their Effect on the Veterinary Profession', *VR*, 88 (1971), 138–41; Peter Jackson, interview with Abigail Woods, 5 January 2011. Between 1964 and 1975, the number of breeding herds dropped by a third, and those with less than 10 breeding sows by 75%. Holdings with more than 100 breeding pigs increased by 350 per cent and the first 500 sow herds made an appearance. Marks and Britton, *A Hundred Years*. There is no critical historical account of these shifts.

¹⁴¹ Harrison, *Animal Machines*.

¹⁴² Wilkie identified this attitude in her study of twenty-first-century livestock farmers, which concluded that 'the instrumental and emotional components of livestock production can and do co-exist'. Wilkie, 'Sentient Commodities', 228.